

Remarks

The Examiner objected to the title as failing to be descriptive. Applicants amended the title as suggested by the Examiner to obviate the objection.

The Examiner rejected claims 1-19 under 35 U.S.C. §112 because the term "dry ionomer membrane" is not clear. Applicants submit dry ionomer membrane is defined to mean, as stated in the first sentence of paragraph 10, a hygroscopic ionomer membrane, or a membrane that readily absorbs or attracts moisture or a membrane having an affinity for moisture. A common characteristic of a hygroscopic ionomer membrane is that it has not been soaked in any solution. "This dry Nafion sheet is obtained in hygroscopic form and has not been boiled, soaked in any liquid, or otherwise treated (i.e. equilibrated in an acidic solution)." See last sentence of paragraph 20. Applicants submit there is adequate support for the definition. Please see paragraphs 9, 20, and 26. Further, the Examiner is correct that the invention for a dry ionomer membrane refers to the state of the membrane during manufacture. See paragraph 5 of the outstanding office action.

The Examiner rejected claims 1-3, 5-10, 12-14, and 17-19 under 35 USC 102 as being anticipated by or, in the alternative, under 35 USC 103 as being obvious over EP 1 037 041 A2 ("041 patent"). Based on the foregoing amendments and following remarks, Applicants submit all claims should be allowed.

All claims were amended to limit the sensor, including the dry ionomer membrane, to the state of manufacturing. The invention also requires the membrane be continuously dry during the entire assembly of the sensor.

The '041 patent does not disclose, teach, or suggest a dry ionomer membrane be continuously dry during the entire assembly of the sensor. In fact, the '041 patent discloses a wet electrolyte layer be used during assembly and be subsequently dried. "Subsequently, the formed sheet and the paste layers are integrally fired, and a film of Nafion,

which is to become the proton-conductive layer 5, is bonded to a predetermined position of the fired body by means of hot pressing. Alternatively, a solution of Nafion is applied to a predetermined position of the fired body and dried.” Page 5, lines 4-8 (emphasis added). Because the cited language describes the assembly or manufacturing process of the sensor utilize a solution of electrolyte that is to be dried at a later time, the '041 patent teaches away from Applicants' claimed invention.

Applicants' specification describes prior art sensors that utilize a wet electrolytic layer to suffer from several disadvantages, including flooding and increased calibration times. See pages 1-2. The claimed dry ionomer membrane reduces problems associated with electrode flooding and reduces calibration time, which are problems often associated with a membrane wetted during sensor assembly, which is kind of sensor described in the '041 patent. Traditional sensors are made with membranes that are provided in an already wet condition, and where the membranes are maintained in a wet condition from production to use by a user, and often have problems with electrode flooding and increased calibration time. See pages 1-2 of Applicants' specification.

Because the '041 patent does not disclose a membrane that is continuously dry during the entire assembly of the sensor, and because there is no teaching or suggestion in the '041 patent to provide a continuously dry ionomer membrane during the entire assembly of the sensor, the rejections in view of the '041 patent should be withdrawn.

U.S. Patent No. 4,879,005 to Fray et al. ("Fray") relates to a wet electrolyte layer that is to be subsequently dried. "A Nafion sheet soaked in water and dried in air." Col. 3, lines 8-10. Hence, similar to the '041 patent, Fray teaches away from Applicants' claimed invention because Fray not only fails to show a membrane that is continuously dry during the entire assembly of the sensor, but in fact teaches an electrolyte layer that is to be wetted during the manufacturing process. Therefore, Fray does not disclose, teach, or

suggest a membrane that is continuously dry during the entire assembly of the sensor and the rejections with respect to Fray should be withdrawn.

As stated on page 6 of Applicants' specification, La Conti represents the prior art having a hydrated solid polymer electrolyte sensor that has slower calibration times and increased flooding. For the same reasons that the rejections with respect to Fray and the '041 patent be withdrawn, the rejections with respect to La Conti should also be withdrawn.

Because all cited references teach away from Applicants' invention, and because there is no disclosure, teaching, or suggestion in any reference to use a membrane that is continuously dry during the entire assembly process of the sensor, all elements of Applicants' claimed invention are not disclosed, taught, or suggested by any reference, alone or in combination with another reference without some modification.

In order for a reference to be properly modified in a rejection under 35 USC 103, there must be some teaching or suggestion to make the modification. Without some teaching or suggestion, one skilled in the art lacks the motivation to make the modification. As discussed above, all of the references not only lack a teaching or suggestion for a dry ionomer membrane, but also teach away from Applicants' membrane that is continuously dry during the entire assembly of the sensor. It can hardly be argued or presumed that Applicants' dry ionomer membrane would be obvious in view of such opposite teachings.

Applicants further submit that a membrane that is continuously dry during the entire assembly of the sensor is not obvious to one skilled in the art because a dry ionomer membrane is thought to negatively affect the life of the sensor. "In this manner the electrolytic medium can be kept continuously hydrated to a constant extend. This increases the lifetime of the gas sensor." See Madou Col. 5, lines 60-68. Together with the teachings of the cited art, all of which teach away from Applicants' invention, no ionomer mem-

brane is continuously dry throughout the entire manufacturing process. Based on the foregoing, Applicants' submit that all claims are allowable and that all rejections be withdrawn.

Respectfully submitted,



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